

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
13 May 2004 (13.05.2004)

PCT

(10) International Publication Number
WO 2004/039932 A1

(51) International Patent Classification⁷: C11D 3/39, 3/16(21) International Application Number:
PCT/GB2003/004625

(22) International Filing Date: 28 October 2003 (28.10.2003)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
0225240.1 30 October 2002 (30.10.2002) GB(71) Applicant (*for all designated States except MN, US*): RECKITT BENCKISER N.V. [NL/NL]; Kantoorgebouw De Appelaer, De Fruittuinen 2-12, NL-2132 NZ Hoofddorp (NL).(71) Applicant (*for MN only*): RECKITT BENCKISER (UK) LIMITED [GB/GB]; 103-105 Bath Road, Slough, Berkshire SL1 3UH (GB).(72) Inventors; and
(75) Inventors/Applicants (*for US only*): WIEDEMANN, Ralf [DE/DE]; Reckitt Benckiser Produktions GmbH, Benckiserplatz 1, 67059 Ludwigshafen (DE). BACHMANN, Frank [DE/DE]; Lehener Strasse 148, 79106 Freiburg (DE). DANNACHER, Joseph [CH/CH]; Peter Ochs-Strasse 33, CH-4059 Basel (CH). DUBS, Marie-Josée [FR/FR]; 49 rue Jean-Jacques Henner, F-68130 Wittersdorf (FR). HAZENKAMP, Menno [CH/CH]; Obere Weid 10, CH-4125 Riehen (CH).

RICHTER, Grit [DE/DE]; Erasmusstrasse 2, 79395 Neuenburg (DE). SCHLINGLOFF, Gunther [CH/CH]; Dinkelbergstrasse 64, CH-4125 Riehen (CH). SCHMIDT, Brigitte [DE/DE]; Talweg 27, 79540 Lorrach (DE). SCHNEIDER, Albert [DE/DE]; Blaserstrasse 68, 79576 Weil am Rhein (DE). WEINGARTNER, Peter [CH/CH]; Hauptstrasse 87, CH-4457 Diegten (CH). WIEPRECHT, Torsten [DE/DE]; Am Dinkelberg 9, 79689 Maulburg (DE).

(74) Agents: BOWERS, Craig, M. et al.; Reckitt Benckiser plc, Group Patents Department, Dansom Lane, Hull HU8 7DS (GB).

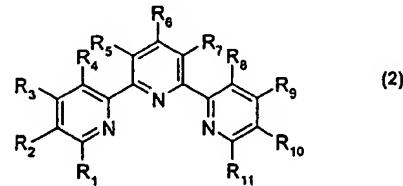
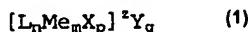
(81) Designated States (*national*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.(84) Designated States (*regional*): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— with international search report

[Continued on next page]

(54) Title: USE OF METAL COMPLEX COMPOUNDS AS OXIDATION CATALYSTS



WO 2004/039932 A1

(57) Abstract: An automatic dishwasher detergent formulation comprising: - (a) a metal complex compounds of formula (1) [$L_nMe_mX_p]^{z}Y_q$ wherein Me is manganese, titanium, iron, cobalt, nickel or copper, X is a co-ordinating or bridging radical, n and m are each independently of the other an integer having a value of from 1 to 8, p is an integer having a value of from 0 to 32, z is the charge of the metal complex, Y is a counter-ion, q = z / (charge Y), and L is a ligand of formula (2); wherein R₁, R₂, R₃, R₄, R₅, R₆, R₇, R₈, R₉, R₁₀ and R₁₁ are each independently of the others hydrogen; unsubstituted or substituted C₁-C₁₈alkyl or aryl; cyano; halogen; nitro; -COOR₁₂or -SO₃R₁₂ wherein R₁₂ is in each case hydrogen, a cation or unsubstituted or substituted C₁-C₁₈alkyl or aryl; SR₁₃, -SO₂R₁₃ or -OR₁₃ wherein R₁₃ is in each case hydrogen or unsubstituted or substituted C₁-C₁₈alkyl or aryl; -N(R₁₃)₂; -NR₁₄R₁₅ or -N⁺R₁₄R₁₅R₁₆ wherein R₁₄, R₁₅ and R₁₆ are each independently of the other(s) hydrogen or unsubstituted or substituted C₁-C₁₈alkyl or aryl, or R₁₄ and R₁₅ together with the nitrogen atom bonding them from an unsubstituted or substituted 5-, 6- or 7-membered ring which may optionally contain further hetero atoms; with the proviso that R₁, R₂, R₃, R₄, R₅, R₇, R₈, R₉, R₁₀ and R₁₁ are not simultaneously hydrogen, as a catalyst for oxidation reactions; and (b) an enzyme.



- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

INTERNATIONAL SEARCH REPORT

International	Application No
PCT/GB 03/04625	

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 C11D3/39 C11D3/16

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 C11D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

WPI Data, EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 01 46368 A (JOHNSON MATTHEY PLC ; OGRODKI VIRGINIE (GB); MURRER BARRY ANTHONY) 28 June 2001 (2001-06-28) claims 1-23 ----	1-28
A	US 6 245 115 B1 (VAN DER VOET GERRIT ET AL) 12 June 2001 (2001-06-12) column 3, line 32 column 22, line 27; claims 1-16 ----	1-28
A	WO 00 60043 A (UNILEVER PLC ; LEVER HINDUSTAN LTD (IN); UNILEVER NV (NL)) 12 October 2000 (2000-10-12) page 24, line 15; claims 1-41 ----	1-28
	-/-	

Further documents are listed in the continuation of box C.

Patent family members are listed in annex.

* Special categories of cited documents :

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the international filing date
- *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

- *T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- *&* document member of the same patent family

Date of the actual completion of the international search

3 March 2004

Date of mailing of the international search report

11/03/2004

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

Richards, M

INTERNATIONAL SEARCH REPORT

International Application No
PCT/GB 03/04625

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
P,X	WO 02 088289 A (SCHLINGLOFF GUNTHER ;WEINGARTNER PETER (CH); HAZENKAMP MENNO (CH);) 7 November 2002 (2002-11-07) page 25, line 14 - line 24; claims 1-27	26
P,A		1-25,27, 28
E	WO 2004 007657 A (SCHLINGLOFF GUNTHER ;FREY MARKUS (CH); DANNACHER JOSEF (CH); HAZEN) 22 January 2004 (2004-01-22)	26
T	claims 1-45	1-25,27, 28

INTERNATIONAL SEARCH REPORT

International Application No.
PCT/GB 03/04625

Patent document cited in search report		Publication date		Patent family member(s)		Publication date
WO 0146368	A	28-06-2001		AU 2016401 A AU 2388701 A CA 2394899 A1 EP 1246897 A1 EP 1240295 A2 WO 0146367 A1 GB 2359560 A ,B WO 0146368 A2 JP 2003518163 T US 2003171446 A1 US 2002040723 A1		03-07-2001 03-07-2001 28-06-2001 09-10-2002 18-09-2002 28-06-2001 29-08-2001 28-06-2001 03-06-2003 11-09-2003 11-04-2002
US 6245115	B1	12-06-2001		AU 749512 B2 AU 4282199 A AU 765582 B2 AU 5636899 A AU 5637099 A BR 9911248 A BR 9913364 A BR 9913367 A CA 2333649 A1 CA 2342616 A1 CA 2342820 A1 CN 1312811 T CN 1325470 T CN 1325435 T CZ 20010770 A3 CZ 20010771 A3 DE 69906732 D1 DE 69906732 T2 EP 1109884 A1 EP 1109965 A1 EP 1087969 A1 ES 2196878 T3 WO 9965905 A1 WO 0012667 A1 WO 0012808 A1 HU 0103943 A2 HU 0104295 A2 ID 28626 A ID 30025 A PL 346391 A1 PL 346569 A1 TR 200003705 T2 TR 200101254 T2 TR 200101257 T2 US 6242409 B1 US 6649582 B1 ZA 200101671 A ZA 200101672 A AU 3963600 A AU 4109100 A BR 0009457 A CA 2364605 A1 CN 1351646 T CZ 20013526 A3 WO 0060043 A1 WO 0060044 A1		27-06-2002 05-01-2000 25-09-2003 21-03-2000 21-03-2000 13-03-2001 22-01-2002 29-01-2002 23-12-1999 09-03-2000 09-03-2000 12-09-2001 16-01-2002 15-05-2003 16-10-2003 27-06-2001 27-06-2001 04-04-2001 16-12-2003 23-12-1999 09-03-2000 09-03-2000 28-02-2002 28-03-2002 21-06-2001 01-11-2001 11-02-2002 11-02-2002 21-06-2001 22-10-2001 21-08-2001 05-06-2001 18-11-2003 28-02-2002 28-02-2002 23-10-2000 23-10-2000 08-01-2002 12-10-2000 29-05-2002 17-07-2002 12-10-2000 12-10-2000

INTERNATIONAL SEARCH REPORT

PCT/GP-03/04625